I would first like to thank Maureen Turim for inviting me to speak at this conference entitled "Perspectives On Television". The title of this paper is "Representation and Abstraction in Video". I will describe a form of video activity referred to as process video and in so doing will show a specific functioning of abstraction and representation within that form.

My interest in this area is the result of several years of video making at the Experimental Television Center presently in Owego, New york. During the past several years a number of video tool theorists, tool designers and image makers have used the video medium to make visual images, speculations, and researches into the phenomena and language of the medium. This has been a rich area of research. This written material I am presenting is to suggest an approach to a body of contemporary video work by a number of video makers.

terminology its corporate prod. video's image prod.

Because this conference is primarily addressing itself to the study of broadcast television programing models I will first need to describe what video is. I will mention some production dichotomies and then some information dichotomies. Because of the range of complexity of television production, television can be divided into the areas of high tech and low tech production. Within high tech one finds the private and public television networks, which we are obviously most aware of. There is also informational intercompany corporate television. There are military uses of television. There is also scientific research imaging. The involvement I am naming low tech includes the shopping center surveillance television, the home consumer with collection of various programing and homemovies. There is university educational television, grass roots community and art center television. There is television used by artists to document performances and conceptual concerns as well as television used as a sculptural object. There is also the exploration of the electronic image often referred to as synthesis or process video.

In the notion of high tech/low tech I am thinking of the size and complexity of the television production on the level of its technology complexity as well as its financial, organization and production complexity. The high tech approaches I am naming tend to

be industrial with large financial investments and a specialized labor force. Low tech approaches tend to be individually or small group organized with smaller financial involvements. In this sort of outline process video could be considered at the high end of low tech. It involves the research and development of visual and conceptual television tools as well as the production of images. Process video is an interdisciplinary art/technology/language approach.

Within the range of the television production dichotomy I have mentioned is an interesting information dichotomy of television. The medium can be used to produce entertainment and performance time structures as defined by the television entertainment networks and also information calibrating, monitoring,and simulating macro and micro time structures as defined by the scientific users of the medium. These basically different uses require the same tool called television.A process video approach can work with aspects of both models,as I will describe.

I would like to mention that I am not taking an anti-network television or anti-scientific television position. I am describing what I sense to be some basic differences in approaches and goals. And since so much confusion seems to exist about process video I would like to suggest where it fits in,what it is, and how one can understand it.

There is a confusion caused by the interchangeability of the terms television and video. The term video is used to describe low tech areas, often to designate a closed-circuit,chamber music,viewing of the tape medium as apposed to a broadcast reception. Broadcast television does not usually use the term video unless it is referring to the program material on a videotape. When the program is broadcast it once more becomes television. This variability of terminology may continue to exist in the same manner in which the terms cinema, film, and movie co-exist.

I would like now to focus in on process video as a specific approach to imagemaking and to attempt to define what it is, how it functions and what it means. This is quite problematic I assure you. Writtings on the subject have been done by the videomakers themselves in often short exacting technical descriptions or general and often metaphorical statements of goals and intentions. Reviewers

attempting to address video work they have seen often describe the work in a comparison to an aspect of a work in an other medium such as painting, photography, cinema, sculpture,etc. ' It looks like...' No doubt this is usefull but it is clearly not enough.I don't think the problem is how to describe it to the general public first but rather how do we understand in ourselves? What is it? What is the nature of its engagement? Analytic vocabularies are used for studying aesthetics, the visual arts, and language. What is missing in an analysis of video is a terminology to describe the physical materials and phenomena of the medium. Mistakenly this is felt to be too technical, too technological and ultimately too mechanistic. What is lost is the ability to understand the work. What is also lost is the ability to generalize about the medium and address the potentials of shifting visual and temporal structures, the operation, interaction and transformation of image codes and finally the sort of understanding of imagemaking as an activity that is an extension of the study of language and discourse.

My interest is in a general understanding of imaging materials. In working with video I have had to confront a fairly specific and complex technical vocabulary of the craft. By sifting through it some generalized concepts appear. I am not intending to present a definitive vocabulary set for video. What follows is a personal working understanding of the video image.

The video image is a physical phenomena. It is in its form structural and architectural. The image in its simplest form is voltage and frequency. The raster refers to the image grid without the picture information. The frequencies of the raster are 60 cycles per second vertically and 15,750 cycles per second horizontally. These frequencies define the speed at which the single dot of the of the video image travels side to side and up and down to draw out the image raster. The grey levels or luminance of the image are encoded within approximately one volt of voltage variation. At the bottom of the voltage range the the image dot at that moment is black. At the top of the range the image dot is white.By the convention of the broadcast industry the frequencies of the raster for transmission are set. There

are several standards in use around the world. American frequencies with 30 frames of image per second provide 525 lines of picture resolution. Most of Europe is on a standard of 25 frames of image per second with 625 lines resolution. France set its own standard of 25 frames per second with 819 lines. Some scientific uses of television use 1000 lines resolution. In all cases the video frame is made up of two fields. One field contains the even numbered lines and one field the odd numbered lines. So American television is 30 frames per second or 60 fields per second and European television is 25 frames per second or 50 fields per second. This is due to the American electrical system being a 60 cycle per second system and the European being a 50 cycle system. The point I want to make is that the frequencies of the raster which determines resolution are by agreements set time bases, even though they can and do vary. In film there are the standards 8mm, super8mm, 16mm, 35mm, and 70mm.

An oscillator is a source of changing voltage. Oscillators are given names referring to the shape of the voltage changing in time, such as sine waves, square waves, triangle waves, sawtooth waves etc. The oscillator is a basic building block of video. The time window of the raster is defined by two ramp wave oscillators. One is operating at at 60 cycles per second and one at 15,750 cycles per second. As I mentioned these frequencies are set. They are two set frequencies defining a set two dimensional space. Time defines space. The scanning is repeating again and again so to determine where something is to appear you are actually determining when it appears relative to the scan rate. Plug in an oscillator into the greylevel or luminance function. The resulting image is a pure abstraction which is a systematic modulation of the energy of the raster. The frequency of the oscillator refers to the rate of the pattern change. The oscillator signal is an example of a basic time based duration or design source.

In comparison to the oscillator signal the video camera image is a complex light and space image based on the coding of the lens. In the camera the light having traveled through the lens strikes the light sensitive tube. This tube scans the two dimensional image

on its surface and converts luminance information, the grey levels, into an electrical waveform. This waveform is also called the video signal. It is the signal running through the video cables. This waveform is a composite of several separate oscillations. The waveform is also the complete set frequencies mentioned earlier. The size and shape of each part of the signal is specified. The size of the video(the picture information), the size of sync.(similar to the function of the sprocket holes in film), the size of burst (a reference signal for decoding color) is set. This waveform can be displayed on an oscilliscope or waveform monitor to be visually analysed. When this waveform is put into the display monitor it is reconverted into grey level information and scanned out as an image. onto the picture tube.

The reason I am mentioning the waveform to this extent is because the camera picture information is encoded in this composite signal. If you change the signal you change the camera picture information. The waveform signal is fluid and vulnerable to interference and manipulation. It is a fast and maleable signal.

Video processing tools allow one high speed, calibrated control of the basic video waveform, its coded structures and parameters. In visual terms more voltage means more brightness. Less voltage means less brightness. Mix two synchronized video waveforms together. The result is a double exposure video. Switch back and forth between two camera signals and you have switching or real time editing. Switch back and forth faster than the complete scan of the raster and you see the first part, the top, of the one image and then switching to the rest of the second image, the bottom, This is also called split screen. If rather than using an oscillator or time base to define the switching from one image to the next one can select a specific grey level of one of the images to determine the point of switching. This switching creates the matting of one image over the other. This is also called luminance keying. If the switching point is determined at a particular color the result is called chroma keying.

So in general a video image processor manipulates the picture information at the level of the waveform by interacting with the coded structures and parameters of the image. This waveform can be

further encoded into a digital signal and be stored and manipulated by digital processes. It is becoming more common to see video processing devices described as hybrid systems using both analog and digital encoding and manipulating techniques. In both cases the original image is altered at the level of a coding.

How does one produce images with such devices? And what is the relationship of the image maker to the programable machine? I would like to suggest an answer to these questions with a description of three very general categories of video tool architecture. One level of electronic tool is so designed by the circuit designer/ artist to generate a very specific image. One could in this case refer to the design of the device as the score for the image. The score could even be notated as the familiar electronic schematic diagram of the circuit. A second and more generalized and controllable tool would be one designed to define image structures and functions in a modular parameter defined fashion. This in its singular form might be a mixer processor or a sequencer, or keyer, or colorizer,or digitizer processor. Any camera or non-camera image passed through it would be analysed and manipulated in a particular fashion. In its multiple form it would be an accumulation of combinations of processors with a patching or programing capability to connect one device to another in a sequence that was desirable to create a particular image. Patching between modular devices is called analog programming. Within this second level of tool,in its more complex form the various parameters of any processor could be voltage controllable. For example the controls of a colorizer such as brightness, contrast, amount of color and which color could be controlled by an external signal , an oscillator for example, in addition to the usual controls one uses to control parameters of the specified process. Rather than the device which produces only one image which I described as the first level of tool, the second level involves a modular functional organization of the image control parameters as well as a means to organize a sequence of image function blocks with potential of external timing controls of the separate parameters of each modular device. This is called an analog video processing system. The third level of electronic tool is that which has the control and complexity potential of a modular parameter system with the additional potential of notating or programing the ordering of the image function block

flow as well as notating timing changes at various levels of the image sequence. This device can produce totally repeatable scored sequences. This electronic tool is a very flexible analog and digital architecture comprised of modular defined analog and modular micro-computer processing elements. It is the hybrid tool I mentioned earlier. It could be referred to as a compositional video processing system.

It is clear that at any level of tool use the control and specificity of function can result in an irrelevant quantity of information, resolution, or control. The video maker working with complex architecture control has many choices and decisions to make. What is the intention of the processing? What images are to be manipulated, nature of control, selection of processes, durations, context, sequence etc.? Will the completed image be a totally calculated composition, an interaction with a compositional structure or a drifting of a delineated field? Or will it approach the static point of total noise or silence ? I am talking about making images.

In addition to architecture there is time. Video processing is real time. That means that the video camera image is manipulated live. Of course there is a micro time interval delay between input and output. The video maker essentially sees the image as it is being manipulated. Recording the image to save it is another step and an other choice. Most processing is never recorded. Video makers have often commented that they both control and interact with the imaging system, even dialogue with it. It is very interesting that an imaging system as fast and architectural in design as the video processing system is can function as a mirror reflecting back to us our own perceptual and conceptual resolution. Such a potential can host quite a drama.

What I have described so far is a reference point to give a sense of what the video image material is and what the nature of the tools used to produce it are. What follows deals with the perception and understanding of the process video image.

I am very interested in the comprehension of video work. I am interested in the primary encounter with the physical image. What is the nature of the image? What is my perception of it? Images are producers of perception and meaning. New image encounters can produce new objects of knowledge. I would like to emphasize the primacy of

of the encounter with the visual perceptual image.
The video image is not an idea first.
The video image is not a diagram first.
The video image is not a caption first.
The video image is not a photograph first.
The video image is physical, visual and temporal first. The conceptual reference points, what we know about the video material, contexts, our conscious thought, the world outside ourselves are an associational reference set reverberating and coinciding with our encounter with the image. The relationship of our experience, pleasure and understanding of the image is an interesting subject. A vocabulary including the concept of the physical image, both visual and temporal, is in a position to grasp the complexity of the simultaneous nature of the visual experience. Such a vocabulary can address the image as material and experience reverberating in a field of perceptual and conceptual relavance.

I would again like to describe a percieving and understanding of a video image sequence. Let us say... a camera image is colorized, the color looks like..., the shifts in color have a percievable pattern, the image is kinetic, the image challenges identification, the quality of the movement is, the camera image chosen is, the context is... the visual is temporal, a camera image is colorized, the image challenges identification; this is a record of some immediate graphic complexity ... This can become an absurd technical exercise. It can also describe a coherent image, a field of perceptions, associations and references. It can describe a pure abstraction or a relational image or idea. The image as a pure abstraction can be a systematic modulation of the raster or a shift of the representation of the camera image through a processing parameter shift. The processed image can refer to time and space in very basic ways. It can also be endlessly complex in a continuous state of drift and transformation.

The fact that the kind of video I am considering is referred to as process video is quite interesting. In general process is a term often used to mean change and transformation. In psychoanalysis process refers to the shifts of form that take place in the unconscious. The notion of process or processual language is particularly interesting. Such a language is concerned with displaying the

developement and creating of meaning in a text.

Process video is the image in a continuous potential of flux. The kinds of visual information shift that take place put representation and abstraction in an interesting relationship. In process video representation can be produced, fixed, transformed and renewed again. Representation can slip. And it slips into abstraction or into partial abstraction with some varying degree of representational reference still functioning. Suddenly the degree of represetational shift refers to an abstract value of change. The representational in a visual parameter shift takes on the suggestion of solid form outside of time to the extent it survives its original reference. The architecture of the imaging system reafirms itself as both abstraction and representation. The image making tool and the image maker interchaneably function as abstraction and representation.

The notion of process with its acknowledgement of functional mechanisms and transformational forms, sliding and production of meaning displays the instability of abstraction and representation. The two become transferable. The abstract markings on a map represent specific values through a key defining the relation. Without the key the representation deflects into the architectural definition of the system. These are the kinds of transformations of poetry and music.

Peer Bode August 1981
Owego, New York

Videotapes shown during the conference "Perspectives on Television"

"Video Locomotion (man performing forward hand leap)"
"Keying Destinctions"
"Music on Triggering Surfaces"
"Vibratory Sweep"
"Apple(s)"

Tapes produced by Peer Bode at the Experimental Television Center Owego, New York. E.T.C. is supported in part by N.Y.S.C.A. and N.E.A. with assistance from the Dept. of Cinema S.U.N.Y. at Binghamton.,N.Y.

Research assistance: David Jones